

Point Data Control Changes in OB3

Predefined Option Sets

The first major change in OB3 is the capability to allow the user to define, store and retrieve point control option sets via the Point Data Control GUI. These predefined option sets are stored in the IHFS database, specifically in the PointDataPresets database table. They provide a convenient and easy way of displaying a point data set without having to select the numerous options that define a specific data display request.

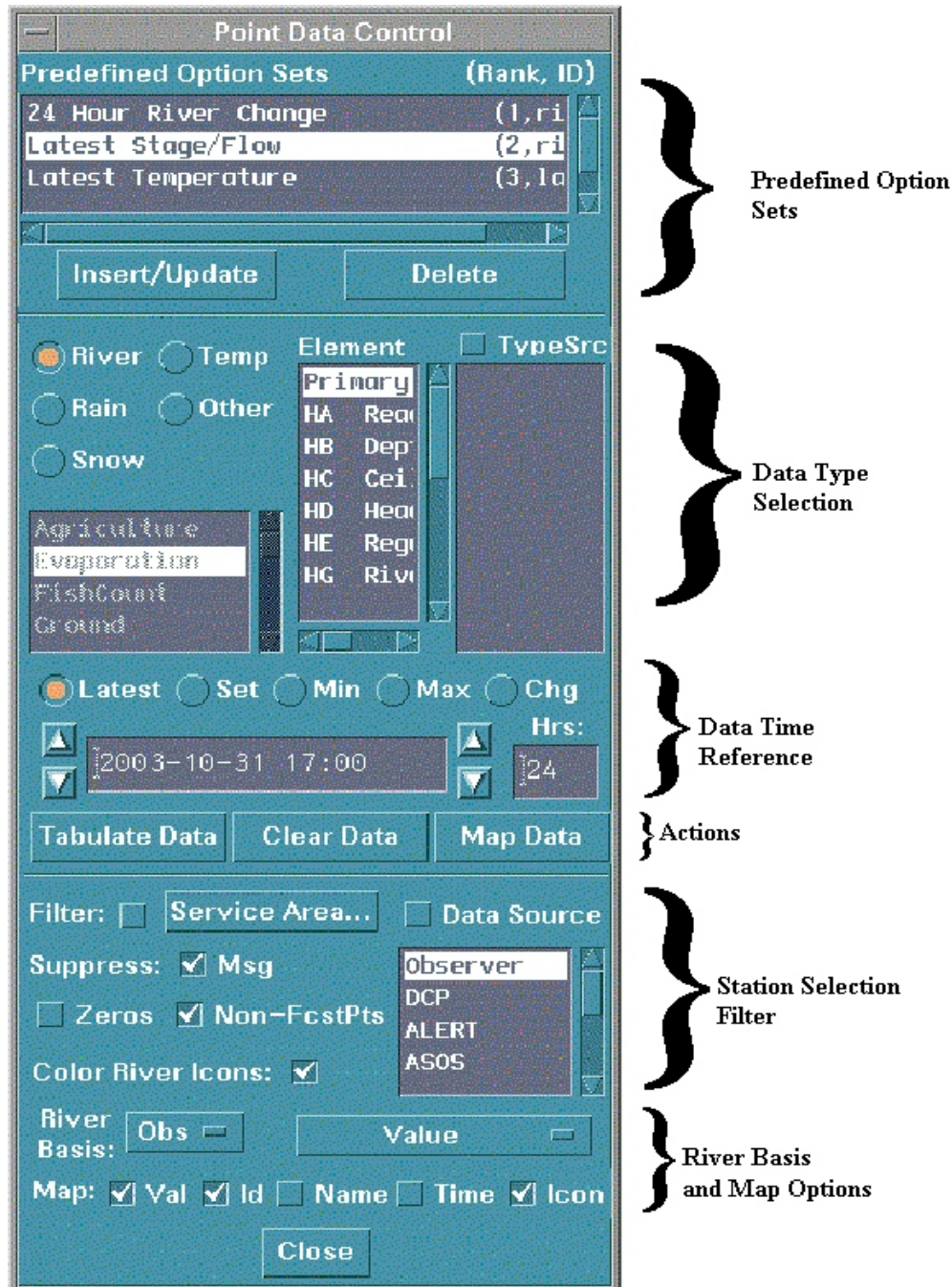


Figure 1. The Point Data Display Control GUI.

Once defined, predefined option sets make using the Point Data Control GUI easy, even for users unfamiliar with all of its data selection controls. The user may easily edit the predefined option sets either by modifying an existing set or inserting a new one. Predefined option sets may also be deleted. This feature also allows the user to customize the initial point data display when Hydroview/MPE is started.

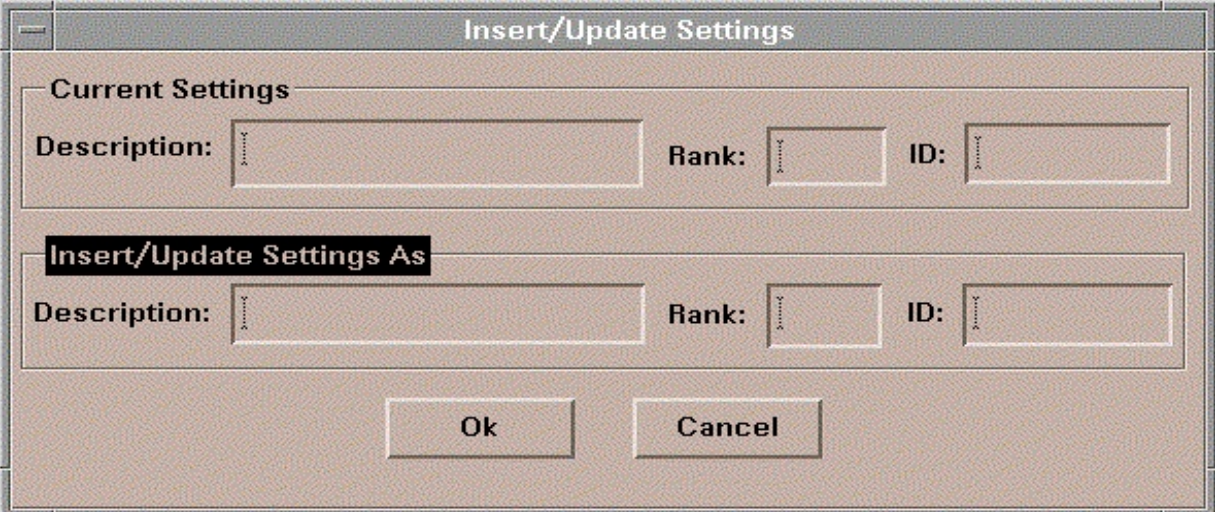
Preset Option Set Selection

It can be seen at the top of Figure 1 that the predefined option set portion of the Point Data Control GUI consists of a scrolled window. Each entry in this window corresponds to a predefined option set. Each is identified by a brief description followed by a rank number and unique identifier enclosed in parenthesis. The predefined option sets are ordered by increasing rank number. If multiple sets have the same rank, then their order in the list box cannot be guaranteed.

Only one predefined group may be selected at a time. A predefined group may be selected using a single or double left mouse button click. A single mouse click will change the Point Data Control GUI settings to reflect the selected preset option group. A double mouse click will change the point control settings to reflect the selected preset option group and it will cause the data to be mapped on the Hydroview/MPE map area.

Creating / Modifying Preset Option Groups

Below the predefined option set window are two buttons labeled “Insert/Update” and “Delete”. The Insert/Update button launches the “Insert/Update Settings” GUI shown in Figure 2 below. The “Current Settings” frame across the top of this GUI shows the unique identifier, the description, and the rank number of the currently selected point control preset group. If no group has been selected, then these fields will be blank. Note that the text fields in the Current Settings frame cannot be edited.



The image shows a graphical user interface window titled "Insert/Update Settings". The window has a standard Windows-style title bar with a minimize button. Inside the window, there are two main sections. The first section is titled "Current Settings" and contains three text input fields labeled "Description:", "Rank:", and "ID:". The second section is titled "Insert/Update Settings As" and also contains three text input fields labeled "Description:", "Rank:", and "ID:". At the bottom of the window, there are two buttons labeled "Ok" and "Cancel".

Figure 2. Insert/Update Predefined Option Sets GUI.

The “Insert/Update Settings As” frame, which occupies the bottom half of the Insert/Update Settings GUI, allows the user to modify the description, rank, unique identifier, and/or point data control presets of the currently selected preset group. Changes to the description, rank, and unique identifier are made by editing the Description, Rank, and ID text fields. Changes to the point data presets are made by altering the settings on the Point Data Control GUI. If the user only modifies the description, rank, or data presets then the record in the IHFS PointDataPresets table corresponding to the selected preset option set will be updated. If the user modifies the unique identifier and this identifier does not correspond to any already defined in the PointDataPresets table, then a new preset option group will be created.

The changes made in the “Insert/Update Settings As” portion of the Insert/Update Option Set GUI are made effective by clicking on the Ok button. When Ok is pressed, a point data preset record is inserted or modified in the PointDataPresets table and the Insert/Update Option Set GUI is closed. From the Point Data Control GUI, the currently selected data type, data reference time, station filter options, and riverbasis/map options are saved as well. When this preset group is selected in the future, the state of the pointcontrol GUI will be restored to reflect these data type, data reference time, station filter, and riverbasis/map settings.

The Cancel button discards any changes the user has made and closes the Insert/Update Option Set GUI.

Deleting Preset Option Groups

The “Delete” button, located below the point control option set window on the Point Data Control GUI, will remove the currently selected preset group from the option set window and from the PointDataPresets table. There is no way to undo this delete aside from recreating the deleted group from scratch.

How Predefined Options Handle Set Time

When a predefined option set is modified or created, the current settings on the Point Data Control GUI are also saved. The time in the “Set Time” window of the Point Data Control GUI requires some special handling. Specifying an absolute set time in a predefined option set would make the set useless after a few days once the point data has been purged from the database. Plus, users are generally more interested in retrieving station data from the past day or so. Given this, when a predefined option set is created the time in the Set Time window is converted into a relative time. The number of days, hours and minutes this time either precedes or follows the current time is determined and stored in the predefined option set.

For example, suppose the current time, to the nearest hour, represented as an Informix formatted string, is “2003-10-30 15”, that is, October 30, 2003 15 hours. Suppose the time in the Set Time window is “2003-10-29 12:00”. This Set Time would be stored in a predefined option set as -1,3:0 which means minus 1 day, 3 hours, and 0 minutes. If this preset option was selected on “2003-11-05 12”, the time in the Set Time Window would be set to “2003-11-04 09:00”

The “Change” Time Mode

The second change in OB3 is the addition of a Change time mode in the Point Data Control GUI. This selection can be seen in the Data Time Reference section of Figure 1. By selecting the “Chg” button in the Data Time Reference section of the Point Data Control GUI, the change in a station’s value over the specified duration can be displayed. For example, this feature can be used to display a station’s 24 hour temperature change or 12 hour change in river stage. This is a good tool for establishing the trend in an observed or forecast physical quantity.

This option was added to allow changes in parameter values (stage, flow, temperature, etc.) over a user defined time period. It is enabled via a new option in the main Point Control window, labeled “Chg”. The change, or differencing function, works over a period of time specified in the hour field in the window. It then takes the most recent and oldest observations it can find in this period. Once these values have been found, then the oldest value will be subtracted from the most recent value to determine the change. The end time of the period of time used in computing the change of the value will be taken as the time shown in the datetime text field on the point control GUI. The beginning time of the period will be taken as that datetime minus the user-specified duration. There is an hour window around the begin and end time within which the program will accept a value, of course it uses the one closest to the exact begin/end time. In addition to showing the actual change value, the user could have the option of displaying the actual amount of time between the oldest and most recent observations of the value. This will be shown when the option to display the time of observation is chosen (by selecting the time toggle button from the map options at the bottom of the point control GUI). It will be very useful to view this time information because the availability of observations will effect the true duration over which a change in a value is computed.

When “change” is selected, the program attempts to determine the change in a value over an interval of time. This interval of time is determined as follows:

1. The value in the Set Time Window is taken to be the end time of the interval
2. The value in the duration window is taken to be the number of hours in the interval
3. The beginning time of the interval is determined by subtracting the duration from the end time.
4. Realistically, it would be rare to have a station which reports at both the beginning and ending times of the interval. So, a window of time is defined around the beginning and ending times to search for the value in. This time window is defined by the `hv_hours_in_window` token.

When computing a value’s change, the program must find two station reports - one at the beginning and one at the end of the interval. Each report must fall within the search time window surrounding the beginning or ending times of the interval. In the case where there are many reports, the reports closest to the beginning and ending times of the interval are chosen.

If the program cannot find two reports for a station matching the time constraints outlined above, then a change cannot be computed and the change value for the station will be reported as missing.

A negative change value means that value has decreased with time. A positive value means that the value has increased with time.

Exception: The change time mode is not supported for any precipitation retrievals. In these cases, an attempt to retrieve precipitation data will result in no displayed or tabulated data.

4.0 TOKEN CONTROLS

The following tokens are used by the point control function:

Initial Settings:

- hv_durhours - Specifies the initial duration in hours that applies to the time window used for the retrievals. The token value is a positive integer value. If no token value is defined, a value of 24 hours is assumed.
- hv_hours_in_window - Specifies a time window in hours. The “change” time mode centers one of these time windows around the beginning time of a user-specified interval and one around the ending time. It uses these windows to search for two values which it can use in computing a change value.
- hv_riverbasis - Specifies the initial setting indicating which type of value is used to base the single, representative value for river values. The possible values are “obs”, “fcst”, and “maxobsfcst”, where “obs” implies use of the latest observed value, “fcst” implies use of the maximum forecast value, and “maxobsfcst” implies use of the maximum of the two. The single value so obtained is used to color the river icon on the main geographic display, and can also be listed using the tabular fashion. If no token value is defined, a value of maxobsfcst is assumed.
- hv_pointdata_display - Specifies the initial state of the “Color River Icons” toggle button which determines whether or not river station icons are colored according to river status. This token may be set to “OFF” or “ON”. When this token is set to “OFF”, initialization of point data is not performed when Hydroview/MPE is started. This decreases the amount of time required to get the application up and running.

APPENDIX A PREDEFINED OPTION SET CODES

Predefined option sets are stored in the PointDataPresets table in the IHFS database. Each preset defined in this table has four pieces of information specified for it:

- Unique preset identifier - This is given in the preset_id column. It is the primary key and is used to distinguish the predefined option sets from one another. It may be up to 8 characters long.
- Preset Description - This is given in the descr column. It is used to describe what the predefined option set is or does. It may be up to 30 characters long.
- Preset Rank - This is given in the preset_rank column. This controls the order in which the sets are displayed in the predefined option set window on the top portion of the Point Data Control GUI. A value of 1 ranks the highest. If multiple predefined option sets may have the same rank then the order in which they are displayed cannot be guaranteed.
- Preset String - This is shown in the preset_string column. This represents the settings on the Point Data Control GUI. This may be up to 512 characters long.

The preset string contains semi-colon separated code groups representing each of the settings on the Point Data Control GUI. Each of these code groups starts with a two character long code indicating which setting on the Point Data Control GUI the group represents. Each code is followed by an equal sign and one or more values. In the case where there are multiple values per code, the values are separated by commas. An example of a complete preset string is:

```
ct=RZ; da=3; de=0; dh=24; ds=1; dt=-1,14:0; fl=0; fo=1; ic=1; id=1; nm=0; ns=8; pe=TA;  
pm=0; pp=0; pr=0; ps=0; rs=0; sb=2; sm=0; sr=Observer,DCP,MESONET,NONE,test; sv=0;  
sz=0; ti=0; tm=0; ts=0; vl=1; vt=0;
```

Table A.1 indicates which character codes are available, what they mean, the values they may take, and which part of the Point Data Control GUI they correspond to. Note for the code “dt”, DD stands for the number of days, HH the number of hours, and MM the number of minutes. It is not recommended that predefined option sets be modified by directly editing the PointDataPresets table. This information is provided for diagnostic and trouble shooting purposes only.

When a predefined option set is modified or created, the current settings on the Point Data Control GUI are also saved. It is straightforward to save most of these settings because many of them are controlled by switches which are either “on” or “off”. For example, the state of the toggle button for coloring river icons can be stored as “0” for off or “1” for on.

The time in the “Set Time” window of the Point Data Control GUI requires some special handling. Specifying an absolute set time in a predefined option set would make the set useless after a few days once the point data has been purged from the database. Plus, users are generally more interested in retrieving station data from the past day or so. Given this, when a predefined option set is created the time in the Set Time window is converted into a relative time. The number of days, hours and minutes this time either precedes or follows the current time is determined and stored in the predefined option set.

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Table A.1 Predefined Option Set Character Code Definitions

| Character Code | Definition | Possible Values | Related PointControl Widget |
|-----------------------|--------------------------------------|--|--|
| ct | Current typesource. | Any valid typesource code (e.g. RG) | Type source scrolled list |
| da | Selected datatype | 0 = River; 1=Rain; 2=Snow; 3=Temperature; 4=Other ; | River, Rain, Snow, Temp, Other Buttons |
| de | Derive stage flow | 0 = No; 1 = Yes | Value Option Menu - Value Stage Flow Option |
| dh | Duration hours | A whole number of hours | Duration Hours text window |
| ds | Filter by data source | 0 = No; 1 = Yes | Filter by service area toggle button |
| dt | Datetime | +/- DD; HH:MM | Set Time text window |
| fl | Show flood level | 0 = No; 1 = Yes | Value Option Menu - Value/Fld Level or Fld Depart/Level options |
| fo | Filter non forecast points | 0 = No; 1 = Yes | Non-FcstPts toggle button |
| ic | Display the station icon | 0 = No; 1 = Yes | Icon toggle button |
| id | Display the station identifier | 0 = No; 1 = Yes | Id toggle button |
| nm | Display the station name | 0 = No; 1 = Yes | Name toggle button |
| ns | Number of chosen data sources | A value of 0 or greater | Number of data sources highlighted in the Data Source scrolled list |
| pe | Current physical element | A valid physical element (e.g. HG) | Highlighted value in the Element scrolled list |
| pm | Comingle processed and observed data | 0 = No; 1 = Yes | Based on value of token shef_procobs |
| pp | Process PC and PP together | 0 = No; 1 = Yes | Indicates if PCandPP item in the Element list for Precip data type has been selected |

| | | | |
|----|--------------------------------------|-----------------|---|
| pr | Process Primary PE from Riverstat | 0 = No; 1 = Yes | Indicates if Primary item in the Element list for River data type has been selected |
| ps | “Processed” selected from Other list | 0 = No; 1 = Yes | Indicates if Processed has been selected from the Other scrolled list |

| Character Code | Definition | Possible Values | Related PointControl Widget |
|----------------|--|--|--|
| rs | Color river icons | 0 = No; 1 = Yes | |
| sb | Stage basis | 0 = Observed; 1 = Forecast; 2 = Max observed/forecast | Based on the River Basis pull down option menu |
| sm | Suppress missing | 0 = No; 1 = Yes | Msg toggle button |
| sr | Data source list | List of data sources to filter by | Data sources highlighted in Data Source scrolled list |
| sv | Filter by service backup | 0 = No; 1 = Yes | The Service Area toggle button |
| sz | Suppress zero values | 0 = No; 1 = Yes | The Zeros check box |
| ti | Display the time | 0 = No; 1 = Yes | The Time check box |
| tm | Time mode | 0 = Latest; 1 = Set Time ; 2 = Min Select; 4 = Max Select; 5 = Value Change | The Latest, Set, Min, Max, Change buttons |
| ts | Apply type source | 0 = No; 1 = Yes | The TypeSrc toggle button |
| vl | Display the value | 0 = No; 1 = Yes | The Val toggle button |
| vt | Display value or departure | 0 = Value; 1 = Departure | The Value pull down option list |
| wf | List of WFOs to apply to service backup filter | List of 3 character WFO ids. | The scrolled list in the Service Backup Office List popup window |